

A Novel Western Multi-blotting Device

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Abstract

Blotting is a common technique widely used for molecular analysis in life sciences. The Western blot, in particular, is a process of transferring protein samples from a polyacrylamide gel to a blotting membrane and detecting the levels of specific proteins through reactions with primary and secondary antibodies. The state-of-the-art of Western blotting usually generates one blotting membrane per gel. However, multiple copies of blots are useful in many applications. Two blotting copies from a single protein gel, for instance, can be used for identifying a total amount of proteins of interest as well as its specific subpopulation level such as a phosphorylated isoform. To achieve this multi-blotting operation from a single gel, we modified a blotting procedure and developed a novel blotting device. The device consisted of a multi-anode plate and a microcontroller. It was designed to generate a well-controlled electrophoretic voltage profile, which allowed a quasi-uniform transfer of proteins of any size. The prototype device was built and its operation procedure was described. The experimental results clearly supported the notion that the described device was able to achieve 5 blotting from a single gel and reduce time and cost for protein analysis.